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AMIEL, R





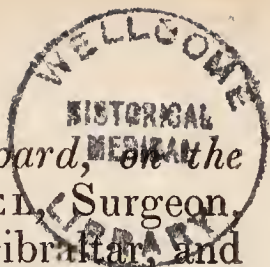


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*Answers to Queries from the Army Medical Board, on the Epidemic at Gibraltar 1828.* By R. AMIEL, Surgeon, 12th Regiment, Resident for many years in Gibraltar, and a witness of the Epidemics of 1813, 1814, and 1828.

*QUERY 2d.\**—What was the civil and military population of the garrison during these years, 1827 and 1828?

*Answer.*—I believe the civil population of Gibraltar might have been computed at 18,000 during the years 1827 and 1828, and the military at about 5000, including the women and children.

The census taken in 1826 carried the civil population to 15,180, and the one taken in January 1829, at the close of the late epidemic, to 15,470.

*Query 3d.*—How were the garrison and inhabitants supplied with provisions in each year, plentifully or scantily?

*Answer.*—The provisions were generally abundant during these two years, and cheaper than at former periods. The Troops were constantly supplied with wholesome food, and with fresh meat three or four times in the week.

*Query 4th.*—Was there any deficiency of water during these years in the wells or tanks? Report on the state of the tanks.

*Answer.*—Water was formerly an article scarce and expensive in this garrison. But since 1814, every house which has been built has had a tank constructed in it. The number of these tanks, which now amount to about 250 or 300, affords a supply of tolerably good water; and we had rain enough during the two above-mentioned years to have prevented a deficiency in this respect; but the poorer classes have seldom access to those tanks, and must purchase water obtained from wells in the garrison, or on the Neutral Ground, which, at the latter part of the summer, is frequently thick and muddy, and at all times rather brackish.

*Query 5th.*—What vessels arrived at the port during the period of the two years specified, as extracted from the harbour master or health officer's register? Give names of vessels, from whence, and where bound to. Advert to bills of health on board.

*Answer.*—It has been impossible to obtain the returns called for from the offices mentioned in this query; and all that has come to my knowledge is, that the number of vessels arrived in this bay from the Transatlantic countries, where the yellow fever usually prevails, since the year 1816, to the breaking out of the late epidemic, amounts to eight hundred and forty-four.

*Query 6th.*—What was the state of the public sewers, and was any marked difference observed in the cleanliness or filth of the streets, houses, &c.? Report at large on this subject.

*Answer.*—I am not sufficiently acquainted with the construction

\* In answer to the first question relative to the state of the Thermometer and Barometer, for 1827 and 1828, tables were forwarded to the Medical Board Office.



and state of the public sewers in general, to submit correct and satisfactory remarks on this subject; but on referring to an official statement of Mr. Woodward's, surveyor of the Revenue Works, I find "That the drains in the lower part of the town have but little declivity, and receive the soil and other filth from those in the upper part, into which the privies of the several houses discharge their contents. The consequence is, that, either by direct winds from the west, or eddy winds from the east, the foul air is blown up from the line wall; and in hot weather, the streets and houses are filled with air so offensive and fetid, as frequently to make the people sick.

"The whole surface of the drains is covered with night soil, which, from the want of water to carry it off, becomes in the warm weather an expanded ridge of putrid matter near the surface of the ground; and the offensive effluvia, disseminated over the whole place, cannot have escaped even superficial observation. During the late epidemic the air was particularly offensive, and great numbers of rats were found dead in the drains. At their outlets on the line-wall, and in many places where I had occasion to direct their opening, I always noticed that they contained a great deal of filth, particularly at the lower part of the town."

It appears, that previous to the year 1814, there were very few drains in Gibraltar; and for want of them, large accumulations of filth called *Dirt's-depôts* were established in various parts of the town. In 1815, the reconstruction of the drains took place, and, since that time, they have been continued at various periods up the hill-side; and the gullies have been covered, which undoubtedly is an improvement in the state of the drains. In rainy weather, they have sufficient declivity to be cleared of their contents; but this cannot be the case in dry weather.

In 1828, the drains were much filled with filth, and it may be remembered that there was in the month of July some rain. On the 1st of August heavy showers fell; and about the 17th, 19th, and 20th of August, there was more rain, which brought the contents into action, so that the effluvia arising from them was very like those arising from the dirt deposits in 1814.

As to the state of the drains more particularly belonging to the barracks occupied by the 12th regiment, with the condition of which it has been my duty to make myself acquainted, I can state that, both in the "Town Range" and "King's Bastion," they appear to have been, and continue to be defective. In the lower square of the town-range, the drain from the soil-pit was choked up and burst open a short time before the regiment was sent to camp: and, in the King's Bastion, the sewers at the north and south, probably from a want of sufficient declivity, frequently allow the corrupt substances to accumulate at their entrances, and emit during the summer months exhalations highly offensive, which, in several instances, have been complained of by the men, and reported to the authorities.

The drains about the south end of the building, where the Regimental Hospital is established, are likewise in a very defective



state. They have been frequently choked up; and their opening in the kitchen, and in the centre of a very small yard, forms a permanent source of disagreeable, and, I may venture to say, pernicious exhalations. In illustration of this, it may be remarked, that the first hospital servant taken ill during the late epidemic was the cook of the establishment who slept in that kitchen, and the disease has been very severe amongst those who have been successively employed on the same duty.

With respect to the cleanliness or filth in the streets or houses, I have not observed any particular difference between this and the preceding years.

*Query 7th.*—Were you ever in the West Indies or Gibraltar, and have you in either place or elsewhere witnessed a similar visitation of sickness?

*Answer.*—I have never been in the West Indies: but during my stay in this garrison, I have witnessed the epidemics of 1813, 1814, and 1828, and I likewise had an opportunity of observing a few severe cases of the same fever in 1810.

*Query 8th.*—In what respect has the late visitation at Gibraltar differed from what you witnessed in the West Indies, or at Gibraltar, or elsewhere, upon any former occasion?

*Answer.*—The late epidemic has differed from those which I observed before, by attacks more frequently insidious, and more generally fatal in the result.

In 1813 and 1814, the disease, in most cases, set in suddenly with rigours, to which soon succeeded flushings of the face, turgidity of the eyes, darting pains in the head, especially about the orbits, and across the forehead, irritability of the stomach with frequent retchings, and a high degree of fever, which at once indicated a severe and dangerous attack.

During the late epidemic, and especially as the season advanced, the disease has been frequently more mysterious in its approach; and erratic pains about the loins, knees, and calves of the legs, giddiness, or slight headach. Eyes dull, with a preternatural dilation of the pupils; a white tongue; a sense of fulness about the epigastric region; langour; diminution of the muscular power; frequent and deep sighs; partial and momentary moisture of the skin; and frequently but little alteration in the pulse;\* were the symptoms which marked its unsuspected progression to that period which characterized the last struggle between life and death.

But notwithstanding the various shades and modifications of this insidious malady in different years, and in different constitutions, yet the similarity has been sufficient to leave no doubt about the identity of the affection.

*Query 9th.*—When and where (*i. e.*) in what street or house, did

\* The pulse was very often a deceitful diagnostic in the epidemic fever. In several instances I have observed but little variation from the natural standard a few hours before death, when other symptoms indicated approaching dissolution.

you first observe the epidemic at Gibraltar; and was its progress clearly traced from any one point?

*Answer.*—The first patient of the late epidemic whom I personally saw, was a lantz-sergeant (of Company No. I.) quartered at the King's Bastion. He was admitted into the Twelfth Hospital on the 2d September, and died on the 5th. But, from what I have been able to learn, the first cases of this fever had appeared about the latter end of August, in District, No. 24; and this information is completely borne out by the official communication of the late Dr. Hennan to his Excellency the Lieutenant-Governor, dated 29th August 1828, an extract of which I take the liberty to subjoin:—

“I have the honour to state for your Excellency's information, that, within the present week, I have personally visited or received reports, of five cases of the bilious autumnal remittent fever, which has made its appearance in a neighbourhood at the back of Hargrave's Parade. One of the cases which I saw had assumed all the appearances of yellow-fever, and proved fatal yesterday; and two of the cases reported to me are stated to be of a similar nature, and will probably lead to a similar event.

“Independant of these cases, which occurred amongst the poorer class of inhabitants, three or four of the family of Mr. Martin, chief clerk in the Civil Secretary's Office, had been attended, in a similar disease, by Mr. Hugh Frazer, Surgeon of the Civil Hospital; and it is not a little remarkable, that the fatal case seen by me occurred in a woman who was a servant of Mr. Martin's.

I have not been able, in any instance, to trace the progress of the disease from a single point; neither did I observe any subsequent attack in the company or regiment, that had any apparent connexion with the case of the serjeant whom I mentioned to have been the first sufferer.

*Query 10th.*—Describe generally the symptoms and treatment of a favourable case of this epidemic, which shall have recovered, and place in the appendix three or four such cases as extracted from the register.

*Query 11th.*—Describe generally the symptoms and treatment of an unfavourable case of the epidemic proving fatal, with general appearance after death, and place in appendix three or four fatal cases as extracted from register?

The answers to these two questions are given in two appendixes; but as they do not tend to the direct determination of the question of local origin or importation, it is believed unnecessary to publish them.

*Query 12th.*—Who were the first attacked with epidemic, consistent with your own knowledge, as separated from general report. Were they soldiers, sailors, inhabitants, as merchants or their families, or Jews, Moors, Spanish, or other foreigners? and advert to answer, No. 9. The period when the person



had resided on the Rock should be noticed; and if recently arrived from another station, that should be noticed, and its healthiness adverted to?

*Answer.*—As far as I could ascertain, the first cases of the late epidemic occurred in individuals of the lower class, residing in District, No. 24. My first patient, as already stated in my answer to the 9th query, was a lantz-sergeant, who had been four years and a-half in the garrison, and who, I was informed, had been disorderly, and in a state of intoxication, two days previous to his admission into the Hospital.

If I am allowed to cast a retrospective glance on the former epidemics, I may state, that, in 1813, the neighbourhood of Boyd's Buildings\* was, as in 1804, the first spot on which the disease made its appearance in Gibraltar; and, as early as the 6th of July, a highly suspicious case of fever, which proved rapidly fatal, was met in the person of a ferryman, who lived in that unfortunate situation; but it was on the 10th of September that Dr. Gilpin, the principal medical officer, reported officially to the Board of Health that cases of fever of a very serious type had, within a few days, become prevalent in town, and that masons, porters, bakers, and people exposed to hard labour, had been principally attacked.

The first case of black vomit which I personally observed during that season occurred about the beginning of September, in a gardener who lived at the south end of the South Barracks. He was a Genoese, and had for some time resided in Gibraltar.

In 1814, the cases which first alarmed the garrison occurred about the 18th of August on the hill side, at Cavallero's Buildings, situate close to Arengo's-Gully, and at the top of the central part of the town. These buildings competed at the time with Boyd's for want of cleanliness. They were inhabited by about 300 Portuguese of the lower order, and close to them, there was an accumulation of filth, (one of the depots for dirt, alluded to in my answer to the 6th query,) which emitted a very offensive stench, and attracted an incredible swarm of flies, which, infecting the whole neighbourhood, became at the time the subject of general observation and surprise.

I may assert, indeed, without fear of the correctness of the assertion being questioned, that whenever the epidemic has appeared in Gibraltar, it has always commenced in the filthiest spot, among the lower and more disorderly class of inhabitants; and that this was the case in the late visitation, is confirmed by an offi-

\*Boyd's Buildings covered a space of 29,200 superficial feet and stood about 200 feet above the level of the sea, in the central part of the town on a ground which appears originally to have been washed from the mountain down two gullies, at the bottom of which they were situated, and the streams of which they obstructed in the rainy season. These buildings were formerly subdivided into small, dirty, and ill-ventilated tenements, into which individuals of the lower class were generally crowded to an excess, and were considered for a long time as the filthiest spot in Gibraltar. They have since been replaced by roomy and commodious houses, perhaps the best built in the whole garrison.

cial communication of the late Dr. Hennen to his Excellency the Lieutenant-Governor, an extract of which I beg leave to submit.— (This has been already adduced in Dr. Smith's paper at p. 15 of No. 106 of Edin. Med. and Surg. Journ.)

*Query 13th.*—Do you consider this disease as originating in Gibraltar, or as an imported disease? State the facts on which your opinion is founded.

*Answer.*—I believe the disease has originated in Gibraltar, and I ground my opinion on the following considerations.

The rise of our epidemic has never been satisfactorily traced to a foreign source, nor its progress marked, from a known focus of contagion, to one or more individuals; and instead of creeping from one family to another, cases have frequently appeared unconnected and scattered at different points; spreading, in some instances, with the rapidity of the electric fluid, and attacking persons who had never approached the sick, nor any assignable source of contagion.\*

Our epidemic fever did not spread at Europa Flats, on board of the vessels in the bay, or on the Neutral Ground, when carried thither from the town; and numbers of individuals who had the seeds of the disease about them, even in the case of their falling sick or dying there, did not communicate the malady to their neighbours or attendants. This important fact, which I had particularly noted during the epidemic of 1813, amongst the foreign recruits quartered at the Brewery Barracks, has been most forcibly exemplified during the late calamity, when neither the bedding, clothes, &c. &c. removed from the focus of sickness, nor the continual intercourse with some of the inhabitants who daily went out to the Neutral Ground, nor the numerous convalescents directly sent thither from the Civil Hospital, often in an early stage of their recovery, produced a solitary case of the disease beyond the gates of the garrison among that numerous population who had fled thither, and who frequently were in confined habitations, when the heat of the weather, the depression of spirits, the melancholy scenes which they witnessed, and, I may add for many of them, privations and hardships, afforded the most favourable means for the propagation of the disease, had it been of a contagious and communicable nature.

Against this assertion it may be stated, that cases of the same fever that prevailed in the garrison, repeatedly occurred on the Neutral Ground, among individuals who, for some time previous to the attack, had not breathed the atmosphere of the Rock. This circumstance certainly leads to the inference, that those individuals contracted the disease by communication with the people going from town; and this inference is corroborated by the

\* Dr. Gardiner, surgeon to the Naval Hospital, and member of the Board of Health established in this garrison in 1813, said, in a communication to Dr. Burnett, then Physician to the Fleet, "That the disease did not spread from any focus, but broke out in fifty different places at once."



fact related before the Board of Inquiry, that a clergyman whose clothes had been recently stained by black-vomit, having been admitted into a shed, one of the tenants was immediately taken ill, and experienced retchings and febrile symptoms, and that shortly after some of the other individuals in the same shed were similarly affected.

But in answer to this objection, I observe that a contagion producing a disease which manifests itself so suddenly, is yet unknown, and that the sudden attack of the tenant of that shed appears to have been the effect of imagination, rather than of any contagious fomites retained in this gentleman's clothes. This is the more probable, because the disease of the tenant and of the other individuals was mild, and at no time showed an unequivocal character; and because the cases on the Neutral Ground were altogether few, and did not present, as far as I could ascertain, any of the violent and dangerous symptoms observed in the garrison.\* The fact, also, that in former years, amongst the few people residing there probably under 400 individuals, cases of fever were annually observed during the summer and autumnal months, which had been frequently attended with very suspicious symptoms; and the few slight cases observed this year, among a population exceeding 6000, placed under the most unfavourable circumstances, far from invalidating my position, evidently tends to establish the principle, that the Gibraltar fever has been literally local, and its infectious properties confined to the vitiated atmosphere of the Rock.

The epidemics which at different periods have raged in this garrison, and on the coast of the Mediterranean, have always appeared about the latter end of summer, or during the autumnal months. If the disease were introduced from abroad, and had the property of propagating itself by contact with the sick, or with substances tainted with the effluvia of the sick, would that property have constantly remained inert during nine months of the year? and do other importable contagions attend to seasons to make their ravages?

The inefficacy of the various means which have been repeatedly

\* The case which chiefly excited the attention of the public, and seems to furnish the strongest argument against this, was the death of Rhaphael Nahon. He had taken refuge on the Neutral Ground in the early part of September, in a shed, with his family, (seventeen in number,) and died there on the 2nd of November, after a very short illness. But the annexed certificate of the medical officer who visited him in his last moments, throws a satisfactory light on the nature of his complaint, and removes every suspicion, especially when it is considered that the rest of that numerous family continued to enjoy perfect health.

(COPY.)

*Gibraltar Civil Hospital, 5th November 1828.*

"I saw Raphael Nahon on the morning of the 2nd of November, in consultation with Dr. Foote; the man was moribund; the condition not to be judged of with accuracy. However, if I may venture an opinion, I do not consider the case to have been one of the prevailing epidemic fever, I should rather be inclined to view it as one of serious apoplexy, occurring in a subject naturally constituted of a most gross, bloated, and phlematic temperament. (Signed) "HUGH FRASER."

employed to stop the progress of the epidemic, such as removing and sending out the sick, shutting up their houses, burning the furniture which they had used, prohibiting intercourse and meetings of all kinds, &c.; and, on the contrary, the success which attended the measure of removing from the impure atmosphere of the Rock those who appeared most susceptible of the fever, as was done in 1813 with many thousand inhabitants; in 1814 with the sickly regiments;\* and during the late epidemic, with the whole population of the 13th and 24th Districts, clearly prove that our epidemic fever is not easily removed from its native soil, nor easily transplanted into another place.

Those cases of fever attended with the same series of symptoms which characterize a severe attack of the epidemic, viz. darting pains in the head, suffusion of the eyes, yellowness of the skin, hemorrhages, hiccup, black vomiting, or dejections, &c. &c. presenting the same morbid appearances after death, and evincing the same property of affording immunity from a second attack, clearly show their identical nature with the epidemical fever, at the same time that their frequent and spontaneous recurrence strongly tends to establish the fact, that the disease originates in Gibraltar, and is produced by local causes.

An opinion has, indeed, been very prevalent, that the epidemics which have appeared in this garrison, and on the coast of the Peninsula, have constantly been imported in vessels from Vera Cruz, Havanah, or the West India islands. But this opinion appears to be grounded rather on popular prejudice, and the illusions of terror, than on philosophical investigations.† Besides the difficulties opposed to this mode of introduction by our quarantine regulations, and there can be no doubt

\* In 1814, the regiment of Dillon, which had arrived in the month of May, was quartered, at the breaking out of the epidemic, in the Blue Barracks, near the Moorish Castle. A great number of men took the fever, and several died, in consequence of which the regiment was encamped on the Neutral Ground, and immediately the fever stopped.

The 8th battillion, 60th regiment arrived from Cadiz in August of the same year, and encamped on the Governor's meadow in a healthy state; shortly afterwards they went into the Cooperage Barracks in town; the fever soon broke out amongst them, and both the officers and men suffered severely. They were sent back to the encampment, and the encampment, and the disease instantly ceased as if by magic.

† "In every clime," says the learned Humbolt, "men fancy to derive consolation in the idea, that a disease which is considered pestilential has been brought from abroad. This belief flatters the national pride. To inhabit a country which produces epidemics might be deemed a humiliating circumstance; and it is more satisfactory to consider that the malady is a foreign one, and that its breaking out has been merely the effect of an accident against which it will be easy to guard in another instance. The people immediately adopt this explanation of the origin of the disease because it is easily comprehended. The medical men, on their side, in general rest satisfied with it, because the word importation relieves them from all responsibility, and from the trouble of investigating the nature and real cause of the disorder. From this has arisen that remarkable facility with which the doctrine of importation has been



of their having been faithfully adhered to, and rigidly enforced in this garrison, the disease has been observed to break out in times when there had been no arrival of vessels from any of these suspicious ports, as it happened in Carthagená in 1811, and in Gibraltar in 1814,\* and likewise in places where the possibility of such importation could not even exist, as in Medina Sidonia in 1801, a town thirty miles from the coast, where the disease broke out about the latter end of August, when all the sea-port towns in the neighbourhood enjoyed a perfect state of health, and gradually proceeded in the same manner as the epidemics in Gibraltar. If it is difficult to explain that peculiar constitution of the atmosphere which determines the prevalence of fevers at one time more than another, it is equally impossible to account for that contingency which produces influencias, malignant distempers of the throat, and other severe epidemics, for a season or term of years, and then allows them to disappear. Moreover, the arrival in this garrison of one or more persons ill of this malignant fever at the breaking out of the epidemic, will not prove its foreign origin or its propagation by contagion; for, on the one hand, this fever has broken out in places where there was not the least possibility of foreign introduction, and, on the other, a number of people labouring under it have sometimes been landed in other places without injury to the health of the inhabitants. It has been alleged by the members of the Sanitary Commission at Cadiz, (Drs. Arejula, Ameller, and Cole) that in the summer of 1805, the fleet of Admiral Gravina, on its return from the West Indies, sent to the hospital of that town two hundred sick, most of them yellow, and many with the black vomit, and other symptoms of the yellow fever; *los mas de ellos amarillos y muchos con el vomito negro y otros symptomas de la fiebre amarilla*; that in 1807, the French Fleet lying in that harbour landed several patients at the hospital of the Aguda with the same symptoms, where several of them died; and although the vessels from which they proceeded kept up a free and unrestricted communication with the town, the disease did not spread at all; *la enfermedad no se estendió, ni comunicó de modo alguno.*†

eagerly received by all classes, when an epidemic manifests itself in a country, and a vessel, a traveller, or a parcel of goods arrive at the same time. So it is that the Havannah, Vera Cruz, and the sea port towns of the United States, constantly accuse each other of the importation of the yellow fever during the summer months, just as the inhabitants of Egypt refer to the arrival of Greek vessels the appearance of the Plague, when in Greece and Constantinople the disease is attributed to vessels coming from Alexandria and Rosetta."

\* In 1814, the first alarming cases of fever occurred about the 18th of August, and the last vessel which had arrived from Havannah was the Spanish Polaca Santa Secla. She had arrived in this bay on the 17th of July in a healthy state, and sailed the next day for Alicant; and I never heard of her having been suspected at any time, either by the people or the authorities, to have left the seeds of the fever which broke out one month after in this garrison.

† Vide dictamen de los tres profesores Medicos Commissionados por

At the commencement of January 1812, when I had charge of the foreign depot, about 460 foreign recruits arrived in this bay from the Spanish coast; part of them were landed here on the 13th of that month; but they were re-embarked the next day on board of the *Downs* and *Langley* transports to proceed immediately for England. By some accident the *Downs* lost the convoy in the night, and came back to this bay, where she lay on the 28th, when I was desired to go on board, as some of the recruits had been taken ill. I observed that, besides their being in a crowded state, they were in great want of clothes—a circumstance which induced them to stay constantly between the decks, in order to avoid the inclemency of the weather. On the 30th of January, the sick, the number of which had increased to thirteen, were landed and brought to the Hospital of Foreign Recruits; and on the 2d of February, eighteen more of the same men who had taken ill were likewise landed, and sent to the Hospital of the 7th R.V.B. The number of the sick, however, continuing to increase among them, an hospital was established afloat on board the transport *Edward*, and, I believe, not fewer than 40 of the same men were admitted into it in the course of a few days. The fever in all these men presented a type more or less continued; was attended with irritability of the stomach, bilious vomitings, yellowness of the skin, &c. &c.; and, although of a milder nature, probably on account of the cold season of the year, had, in all essential points, a perfect resemblance to the epidemic, which has prevailed in this garrison.

The circumstances which preceded the breaking out of this fever, render it impossible to trace it to the introduction of a foreign poison; and its not having spread to the people lying in the same wards with those patients when ashore, proves that it was not propagated by a specific contagion, but was a disease generated in that filthy and crowded vessel—which is the more credible, as a ship, having many places inaccessible to ventilation, and where corrupt substances may be concealed, will easily become an unhealthy and dangerous place of abode, from the crowded state in which people may happen to be on board, from inattention to cleanliness, from the bad quality of provisions, &c. &c.; and there are but too frequent records in the annals of medicine of the yellow fever having broken out in vessels when passing into tropical latitudes, or lying in our harbours during the warm seasons. Evidence of these facts is afforded by the history of the English ship *Penelope* taking emigrants in 1801 from Ireland to New York; by that of the *Hibbert* from Portsmouth, bound to Honduras in 1803; and of a vessel from Liverpool to Demerara, with horses on board, as mentioned in a letter from Dr. Chisholm in the *Medical Repository*, Volume v. page 229; and also by the statements of Drs. Meyer, Holland, Legier, Pineda, and Peres, quoted in the Report of the Commission appointed in 1828, by the French Royal Academy of Medicine of Paris, to examine Dr. Chervin's documents concerning the yellow



fever. In fact, whether an epidemic fever arises from filth and putrid vapours ashore or on board, the cause and accompanying circumstances are the same, and must lead to the same result.

*Query 14th.*—In what respects does the late epidemic differ from the bilious remittent fever of the same place at certain seasons of the year?

*Answer.*—I believe the epidemic differs only in degrees of intensity from the autumnal bilious remittent fever of this climate: and I am the more strongly induced to adopt this opinion, as I have occasionally witnessed, in times when the bilious remittents were frequent, cases attended with the violent attack, the high malignity, and the rapid dissolution which more generally mark the character of the epidemic; and during the epidemic season, instances have been frequent in which the disease has retained the mild form and the distinct character of the bilious remittent.\* This was particularly remarked in 1810, and during the epidemic of 1814, and has also been remarked at the breaking out of many epidemics, probably from the circumstance of the morbid causes not having yet acquired their concentrated energy and virulence.

I was in this garrison in the year 1810, and I had the opportunity of more particularly observing the different gradations of the disease as it appeared in this place during that year. Bilious remittents were very prevalent in July and August, especially in the hospital of the foreign recruits, of which I had the charge. In the month of September some cases of that fever appeared likewise in the same hospital, but they were attended with more malignity, and two ended fatally with hemorrhages from the nose and mouth. I was at that time desired now and then to visit some inhabitants labouring under a fever presenting the same symptoms; especially in the neighbourhood of *Scud-Hill*. On the 20th October, I was called to see Jacinto Reys, a carpenter in the dock-yard, attacked with fever. He had been working three or four days on board the *San Juan*, lying in the Mole, where he was taken ill. The leading symptoms were severe headach; eyes injected; dorsal pains; pulse very quick and full; great irritability of the stomach; constant retchings, and vomitings of bilious matter, &c. &c. The disease went on through its periods to the seventh day, when free perspiration was followed by a favourable crisis. On the 22d of October, Andrew Reys, an elder brother of the patient, who lived in a neighbouring house, and had been in the habit of visiting him frequently, was taken ill with the same leading symptoms; and in the course of three days, the mother, the grandmother, a child, and a person who lived on the same floor, were taken ill of a fever presenting the same symptoms as Jacinto Reys. Andrew Reys died of that fever on the 26th of October; the rest of the family were sent to perform quarantine on the Neutral Ground, and sentries were

\* Dr. Arejula, in his *Succinta Descriptio febris Epidemicæ Malagæ* says, that in 1803, the febrile actions frequently assumed a remittent type, the cold, hot, and sweating stages being evidently distinct, and the disease was frequently protracted to the 11th, and sometimes to the 14th day.

placed around the houses they had left, to prevent any intercourse of the inhabitants with that spot.

No new cases appearing in the garrison,\* the quarantine was taken off on the 24th November, and the families allowed to return to their homes. A younger brother, however, named Joseph Reys, fourteen years old, who had been very healthy on the Neutral Ground, was, three days after returning to his house, seized with a fever which presented the same symptoms as his brothers, but in a more aggravated form. On the third day a vomiting of a black matter came on, and he died on the fourth day from the attack.

The circumstance of that boy having been attacked with fever soon after his return into the garrison, was at that time brought forward as a strong argument of his having caught the fever by coming in contact with the clothes which had been used by the family when sick, and before they had been removed to the Neutral Ground; but, besides this having been a very gratuitous supposition, which the family denies, the circumstance of two Genoese, Santiago and Francisco Prospero, having been taken ill in the neighbourhood, and on the same day (the one of whom died likewise with black vomit) without having had any communication with the Reys family, disproved such assertion; and considering that the small district where those fevers broke out was then so filthy, crowded, and unventilated, as to have induced the Lieutenant-Governor to order nine sheds to be removed from a space of ground not exceeding 300 superficial feet, it appears highly probable, that the disease had originated in that spot, from local and domestic causes.

On examining with attention the circumstance of the fever which prevailed here during that year, it appears to me evident, from the facts which directly came under my observation, that atmospheric causes, more or less powerful, according to the different changes of seasons, gradually influenced the degree of intensity of those fevers, from the mild type of the bilious remittent in July and August, to a more aggravated one in September and October, attended with great irritability of the stomach, but with remissions still distinct, and lastly, in November, to that malignant type which brought on the dissolution in four days, preceded by black vomiting. The causes of the fever which attacked the whole of the unfortunate Reys family must have had the same origin; but those causes were more concentrated, and had acquired a greater energy when they attacked Joseph Reys, the last victim.

Bilious remittent fevers were likewise very prevalent during the summer of 1813, appearing under the same mild type in July and

\*A considerable change in the state of the atmosphere took place suddenly on the 27th and 28th October of that year, in consequence of heavy showers of rain and north winds. The thermometer which had until then ranged from 65 to 78, rapidly sunk to 53,—a degree of cold, (says Dr. Pym in his official communication to the Army Medical Board, dated 2d November 1810,) very uncommon in this climate at this season of the year, and, in his opinion, very favourable for the destruction of the contagious power of the disease.



August; but, as the autumn approached, I observed they were assuming a more aggravated character, and at the commencement of September, two gardeners died in the south, one opposite Cooper's Buildings, and the other near the South barracks, in less than five days; and these two fatal cases, which I know to have been previous to, or contemporary with, those observed in the City Mill Lane, have convinced me that the report which was then circulated, of the fever having been imported from Cadiz, into the latter spot, was entirely groundless, and the history of the epidemic of 1810, 1814, and 1828, showing likewise a domestic origin, corroborates the opinion, that the bilious remittent and the epidemic are modified gradations of the same disease, and proceed from the same sources;—that they are a disease of the climate, equally distinct from the continued fevers of crowded cities, as from typhus, which is known especially to arise from an accumulation of human effluvia.

In support of this position, I take the liberty of annexing an extract of the summary remarks of the late Dr. Hennen on the diseases of the quarter ending 20th September 1826; and the observations of such an able observer equally distinguished by sagacity and judgment, cannot fail to have great weight, and in my opinion are conclusive.

“Some of the fever cases required very active treatment, and were attended with considerable determination of blood to the head or abdomen. These were principally occasioned by irregularity of living, and exposure to the heat of the sun. In other cases the attack was of a less marked character, and in a few days made its approaches in a very insidious manner, developing in its progress all the characters of the autumnal bilious remittent, the endemic disease of the whole of the Mediterranean coast. One of the cases occurred in a man who had been for a long time employed on the Neutral Ground, and three took place in individuals who contracted their disease within the walls of the garrison.

“Upon the whole, although the Neutral Ground principally is productive of fever of this description in the autumnal season, I cannot entertain a doubt that the disease also appears among persons who have contracted it in town, having seen no less than six cases, including civilians, in proof of it, within the last three months; in two of these, dark-coloured matters were ejected from the stomach resembling coffee-grounds, and, like them, sinking in water. In those cases, dissection exhibited a highly diseased state of the stomach, the coats of which were inflamed, pulpy, and as easily torn as a piece of blotting-paper. The practice which I am led almost invariably to recommend in these fevers, is the early employment of calomel, so as to affect the mouth, aided by an equal early use of the lancet, or of leeches according as circumstances may indicate general or local bleeding; to which are added tepid spongings, purgatives &c. &c. as occasional symptoms may demand. I have never witnessed more striking relief in any disease than was produced by the application of fifty leeches to the head and temples of an officer's wife whom I attended. Her disease was contracted

upon the Neutral Ground, where her husband has long resided as commandant. Another inhabitant who lived in the gardens on the opposite side of the road was not equally lucky. He died on the fourth day, harassed by incessant vomiting of the nature mentioned above, and with his skin deeply tinged with yellow.

“Six out of the nine deaths which occurred during the quarter were the consequence of fever.”

*Query 15th.*—What the diagnostic symptoms?

*Answer.*—The epidemic fever, as far as my knowledge goes, has no specific character, no appropriate, essential, or pathognomonic symptom, no definite course of duration. But its prominent features are most generally great pain in the head and in the loins,; strong and quick pulse; turgidity of the vessels of the conjunctiva; moral and physical prostration; sensibility and irritability of the epigastric region; anxiety; tongue dry and red; yellow tinge of the skin; great variations in the urinary secretions; passive hemorrhages from the nose, tongue, gums, anus, &c.; dark and even black vomitings or dejections; delirium; coma, &c. The whole or part of these symptoms appearing together, form what I consider the surest diagnostic of the epidemic fever.

*Query 16th.*—Do you consider the disease contagious, *i. e.* propagated by contact; and did the very latest cases appear to have been contagious?

*Answer.*—I do not think that the disease has been at any time propagated by contact; and although the facts stated in different paragraphs of my answers in support of this opinion are merely negatives, they are general facts, so constant, and so repeatedly observed, that, altogether, they afford what I believe most conclusive evidence.

*Query 17th.*—Do you consider the disease infectious *i. e.* propagated by the infected atmosphere of a sick room?

*Answer.*—I am not prepared to say how far the atmosphere of a sick room may, by the accumulated effluvia from numerous bodies labouring under a violent form of the epidemic, contribute to the propagation of the disease; but I believe that a man affected with this fever will not communicate it to another sleeping in the same room, when there exists no epidemic influence, and where common cleanliness is observed; and I ground this opinion upon the following facts which came directly under my observation during the late epidemic.

It is a well known fact that the fever spread in the South two or three weeks later than in the town. From the 2d of September to the 1st of October, several cases of the epidemic were admitted into the Regimental Hospital, three of which died with the black vomit; but the disease never attacked any of the other patients, (more than twenty in number,) treated during the above period for other complaints, nor any of the orderlies, who had as usual, an incessant and unreserved intercourse with the dying, and slept in the same wards. It was only on the 25th of September, when the disease had spread



in the south, and when the epidemic influence had extended to the district where the hospital is situated, that the cook of the establishment, who never had occasion to approach the sick, contracted the disease; and in the month of October when the atmospheric causes had acquired more intensity, the hospital serjeant and twelve orderlies, successively sent from the camp, were taken ill but a few days after entering the precincts of the hospital; and several of them fell victims to the disease.

*Query 18th.*—Do you consider the disease epidemic propagated by the general vitiation of the atmosphere of the Rock.

*Answer.*—That our epidemics are the result of an atmospherical vitiation appears to me evident from the fact of the disease having been constantly influenced by atmospheric states. It has had a fixed period for its appearance, a fixed period to attain its maximum of mortality, and a fixed period for its termination. If this last epidemic has been protracted two or three weeks beyond its regular duration, it is to the influence of the mild temperature which we enjoyed during the latter part of the season, that this circumstance must be ascribed.

The different epidemics which have appeared in this garrison at different periods, as well as those which have raged at Cadiz, Xeres, Sevilla, Malaga, Alicant, Carthagen, Barcelona; and perhaps I may add others which have appeared in similar latitudes, as in New York and other towns in the North American coast, have constantly broke out about the latter end of August or beginning of September; they have gradually increased so as uniformly to produce the greatest mortality in October, most generally from the 9th to the 20th,\* and then to diminish successively until the noxious exhalations have been condensed by cold, or washed away by heavy rains.

The numerous instances of two, three, or more persons having been attacked in the same house, at the same time, and even at the same hour; and that general susceptibility which so rapidly pervades all ranks, show, not that the disease has the property of spreading from person to person, but rather that it is produced by a general cause, to the influence of which they have been simultaneously exposed.

If this disease were produced by any other cause than an atmospherical vitiation, would the period when the greatest number of patients affords more extensive means for its propagation in populous cities, become the marked period for the abatement of the disease, and for the diminution of the number of its victims? In 1803, the population of Malaga, at the breaking out of the epidemic, amounted, according to Dr. Arejula's Tables, to 48,015, and

\*In Sevilla, the greatest mortality, in 1800, took place on the 14th of October, and in the epidemic of 1804, on the 9th of October, at Gibraltar, Cadiz, and Alicant. On the 10th at Antiquera and Grenada. On the 15th, at Xeres, Cordoba, Montilla, and Moran. In 1821, on the 19th of October at Barcelona; and in Gibraltar in the epidemic of 1813 and 1828, the greatest mortality occurred on the 17th of October.

out of that number, 16,517 were attacked, and on the following year 17,000. In Barcelona in 1821, the population which remained in town, was computed to about 80,000, 30,000 of which passed the disease. And in Cadiz, in 1810, out of 130,000, 12,000 were attacked; but in Sevilla, in the year 1819, the number of those who contracted the disease did not reach 2000 in a population exceeding 70,000 inhabitants.\* Thus the disease in all these instances, did not stop its progress for want of subjects, or by the effects of any sanitary regulations, but evidently began to subside when the atmospheric agents diminished, or ceased from their deleterious influence.

If this disease were connected with any other cause than an atmospheric poison, would its ravages be constantly limited to certain climates, in these climates only to certain places, in these places only to certain seasons of the year, and even in these seasons would it only appear after a particular degree of heat and moisture?

The peculiarity in our epidemic of modifying, or completely changing the nature of all acute, and some of the chronic, diseases, drawing them, if I may be allowed the expression, into its vortex, and stamping them as it were with its own seal, affords, in my opinion, a convincing proof that its primary cause must be an atmospheric agent, as no other in nature could so uniformly extend its influence upon all who lived in a district, or a town, &c. &c. so as to produce the general, sudden, and uniform transition from the healthy to the unhealthy state, which are remarked during the prevalence of the epidemic; and further, as the alterations in the atmosphere happen generally at regular seasons, so the diseases connected with these variations have constantly appeared at regular periods. Thus it is that a scientific observer well known in the annals of military medicine (Sir John Pringle) who has constantly considered the degree of heat, at the latter part of the summer or beginning of the autumn, joined to a dampness of the atmosphere, as the cause of the bilious fever of camps, refers to the same source the bilious fever of every country and of every climate, as well as the yellow fever in America; which, in his opinion, is no other than the maximum of the bilious fever. In fact the connexion of the yellow fever with the state of the atmosphere is so intimate, and so well marked in the intertropical regions, that another accurate observer, (Dalmas,) after a residence of ten years in the West Indies, could, by the inspection of his barometer, foretell the re-appearance or cessation of this malady.

The instances of people labouring under this fever having had intercourse with others liable to it on the Neutral Ground, or at Europa-Point, are very numerous; but it is very doubtful if in any instance the disease has been contracted beyond the sphere of the local causes from which it has originated.

The 12th Regiment was removed to the Neutral Ground on the 5th of September last, after having sent five cases of fever to the

\* Vide Relacion do lo ocurrido en Sevilla con motivo de la enfermedad de 1819, page 14.



Twelfth Hospital, two of which died with the dreadful symptom of the black vomit; but, from the period of their encampment until the 25th of September, the soldiers having had no duty to perform in the town, no fever cases appeared amongst those in the camp, while several orderlies attached to the different departments which remained within the garrison, were attacked with the epidemic; and it was from the 25th of September, when the regiment had resumed the town duties, that is to say, when the soldiers came to breathe the pestilential exhalations in their stationary sources, that the admissions became numerous, and the increase of disease most alarming.

Ninety-two women of that regiment, and 190 children, who never were allowed to repass Bayside barrier, have continued perfectly healthy; and one woman only, (the armourer's wife) who, during the period, obtained leave to enter and stay a few days in the garrison, caught the fever and died of it.

Several of these women passed the night in the same beds with their husbands attacked with, and labouring under, the epidemic fever, and besides continued, as well as their numerous children, to use the same bedding after the men had been removed to hospital; but in no instance was the disease contracted by the wife or the children, even after that full exposure.

Four orderlies employed in the hospital sheds on the Glacis, who attended several cases of fever admitted into that hospital, escaped the disease; while the whole of those employed during the month of October in the hospital at the south, one of the watermen excepted, contracted the epidemic, and several died.

It has been said that the pure air of the Neutral Ground checks the contagious property of the fever; but when the wife in the same bed came in contact with the patient scorched with febrile heat, or bedewed with copious perspiration, when she inhaled under the same tent the effluvia of his breath, how could the air, however pure, sufficiently interpose to arrest the process of contagion, and its fatal consequences?

From the foregoing observations, I conceive it results that the disease does not spread when the sick are removed from the impure air in which it was contracted, and likewise that, by breathing the impure air without exposure to the contact or effluvia of the sick, persons are frequently attacked; while, on the contrary, without breathing it, however exposed to such contact or effluvia, no person is attacked. Experience, therefore, warrants the conclusion, that impure air is the primary and essential cause of this disease.

I consider as secondary causes, mental depression, exposure to heat, cold, fear, intemperance, anxiety, &c. which, in some individuals, have brought on an immediate attack of the epidemic fever; while others, by carefully avoiding these exciting causes, have been uninfluenced by the noxiousness of the atmosphere, and escaped the disease.

*Query 19th.*—Each opinion to be supported by facts without any reasoning.

*Answer.*—The facts on which my opinion is founded are described in my answer to the preceeding query. I may add as an observation in some manner forced on me by the circumstances attending the same, that, when so many new cases occurred in the regiment after it had resumed the town duties, the men composing the guards were marched directly from the Neutral Ground to the guard-houses, mostly by the Line-wall, and avoiding the streets as far as possible; that, those in guard-houses, which were frequently white-washed, had no communication whatever with any description of inhabitants, and still less with the sick, or articles belonging to them; that they were marched to and from the posts of the guards without being allowed any improper intercourse; and that, ultimately, they went back to the Neutral Ground with the same precautions, and in the same orderly manner as they had come from it; thus rendering it impossible to trace to any contagious source the malady which unexpectedly manifested itself in many of them but a few days after they had been employed on that duty. And, indeed, to what sources could be referred the frequent and violent attacks which continued to be more especially observed amongst the soldiers at the North-Flat Bastion Guard, which is situated in the 24th District, after all its inhabitants had been removed, and the houses shut up, but to the deleterious exhalations, which, having produced on that spot the first cases of the disease, successively formed a focus of infection so fatal to the soldiers who breathed the vitiated atmosphere, that government found it necessary to suppress that guard, and even to remove to a greater distance that which had hitherto been stationed at South-Port Gate, the nearest to that infected district.

*Query 20th.*—Had malaria, or the effluvia from marshy places, any, and what, influence in the production of this disease?

*Answer.*—From a careful attention of the different epidemics and sporadic cases of this fever which have come under my observation during a residence of eighteen years in this garrison, I am induced to consider putrid effluvia as its primary and essential source. Like remittent fever, and all diseases known to arise from the same cause, the epidemic has never appeared but in the warm season, when heat, acting on putrid vegetable and animal matter, produces the febrilizing gases; and, like them, it has ceased when the sources of those morbid gases have been condensed by cold, or washed away by long continued rains. Like them also, it seems to have exerted its morbid influence more particularly on the gastro-hepatic system, and has been marked by that same characteristic diversity in its mode of approach and individual attack, which, according to the less or greater intensity of the exciting causes, resembles a mild bilious fever in some, and the rapid effects of a deadly poison in others; thus evincing, by the nature of those va-



riations, that the epidemic having no peculiar symptom to fix its character, differs from the diseases propagated by a specific virus, and is evidently the offspring of those effluvia, which, in their mysterious combinations, as they are more or less virulent and concentrated, produce an ague in the plains of Lombardy, and a most malignant fever on the Banks of Senegal.

But an argument which farther establishes the influence of malaria in the production of our epidemic, may be derived from another peculiarity known to belong to all malaria diseases,—namely, that its attacks were more dangerous, and have been more frequently brought on by exposure during the night. This observation was too often confirmed during the late calamity, by the frequent attacks amongst the soldiers sent from camp to perform night duties in the garrison, while numerous inhabitants who continued their intercourse, as in 1814, came every morning from the Neutral Ground to their daily avocations in the town, have most generally escaped the disease, by avoiding to pass the night in the fortress.

It is true that the sources of marsh miasmata are not easily traced in Gibraltar, where the Rock is covered with soil only to a certain distance from its basis, and the declivity in general so rapid, as to render it very difficult for any water to stagnate, or to remain long on its surface.\* But the vicinity of an extensive beach, where, amongst other nuisances, all the drains of a numerous population empty themselves, the nature of the soil chiefly formed by the alluvial matter of the rock, the decay of vegetable productions in the several gardens covered with rich manure, and the neglected state of the privies and drains, in spite of the wisest regulations and unremitted exertions on the part of the authorities, may, under a powerful sun, and a degree of moisture which easterly winds, fogs, and slight rains impart to the atmosphere, produce in the latter part of the summer exhalations as deleterious as marsh-miasmata, which, according to their degree of concentration, and the predisposing circumstances, will generate fevers more or less aggravated in their type or duration †

That Gibraltar has at all times possessed within itself many loca

\* “Marsh and swamps,” says Dr. Blackburne, in his *Remarks on Infection*, page 92, “are far from being the only sources of miasmata hereafter perhaps more justly named febrilizing gases. The foul shores of the sea—the moist slime and mud on the banks of great rivers, and of mill-ponds—the mire and mud in the unpaved streets, ditches, lanes, and passages, of great towns and cities, villages, &c. particularly the cellars and damp abodes where the poorest classes are most frequently doomed to dwell—the moats of garrisons, &c. &c.—the soil where certain hospitals, barracks, or encampments are situated—the wells and cellars, damp cells, and dungeons of prisons, and the holds of ships, are all calculated to emit pyrexial effluvia from the moist earth, mud, or filth, which are most commonly to be found within their precincts.”

† Marshy exhalations by themselves will complicate, but are not sufficient to produce the yellow fever, to the developement of which, according to an author who for many years had opportunities of observing

causes of fever capable of assuming the most malignant type when exercising their full influence upon a densely crowded and filthy population, is perfectly obvious, and established beyond the possibility of cavil, by the records of the Civil Hospital, and by those of every regiment that has been for a time stationed on the Rock, as well as by the observations of the civil practitioners. Dr. Gray, physician to the Mediterranean Fleet, and for some years to the Naval Hospital in this garrison, after having stated in a report to the Transport Board, that the bilious remittent fever is more or less endemic in Gibraltar during the summer and autumnal months, and pointed out with great accuracy such local causes as may generate the disease, thus describes the following symptoms as attending its aggravated state.

“Great prostration of strength; excruciating headach, referring to the forehead and orbits; eyes turgid; flushed countenance; oppression at the præcordia; general pains of the back, loins, and calves of the legs; great irritability of the stomach, and bilious vomitings; yellow suffusion of the skin, and, towards the fatal termination of the disease, hemorrhages from the nose and mouth, with black foetid stools. I have also observed in some instances,” Dr. Gray adds, “the matter ejected from the stomach of a dark colour, resembling coffee-grounds. During the long period of serving I cannot recal to my recollection a single instance of fevers being communicated from one person to another, either amongst medical attendants or nurses.”—(London Medical Repository for November 1817, page 417.)

Staff-Surgeon Glasse, whose veracity is so well known in this garrison, where he had resided ten years, says in a document which has been published, “During the autumn, I have been in the habit of seeing solitary cases of fever attended with black vomiting and other severe symptoms, both in the town and south, without the disease being communicated to others confined in the same building.”\* It remains for me to add, that malaria produced by exhalations from common sewers, probably from its being more especially the result of animal decomposition, appears to exert a most powerful influence over the character of this fever; and of the truth of this fact, which I have had frequent occasion to observe while I had the medical charge of the Dock-Yard Department, and of the poor in the south district of the garrison, I shall mention only two striking instances.

In 1813, the first patient that I saw with the black vomit lived in a gully at the south end of the South Pavilion, in the close vicinity of a drain, the noxiousness of which had been repeatedly

the complaint, must occur a certain degree of heat, the insalubrity of the place, the idiosyncrasy of the subject, and occult atmospheric disposition.

\* Out of regard for truth, I must observe, that since 1816, cases of this description have been far less numerous in this garrison, which I have no hesitation to ascribe to the improved state of cleanliness.



reported to the authorities; and I was under the necessity of sending to the Civil Hospital, at different periods, from the same neighbourhood, three gardeners, two of whom rapidly died of fever in that establishment.

From 1819 to 1822, I repeatedly had under treatment at the Naval Artificers' quarters at Rosia, in the latter part of the summer, cases of fever attended by irritability of the stomach, yellowness of the skin, and other severe symptoms, some of which terminated fatally; and having observed that a common sewer in the centre of that building was then in a defective state, and occasionally emitted very offensive effluvia, I reported the circumstances to the Commissioner of the Royal Navy in this garrison, as mentioned in my annual report of 1823; the drain was removed, and from that period I have not seen or heard of any similar attack of fever occurring in the establishment.

During the late epidemic, the first cases of fever in the south appear to have occurred in the neighbourhood of the gully, near the bridge leading to the hospital, where the offensive vapours of a large drain were very remarkable during the summer months; and the disease has been especially severe on that spot, as in every other place deprived of a pure and free ventilation.

*Query 21st.*—Were critical days observed in the course of this fever?

*Answer.*—I believe in its violent attacks the progress of the disease has been so rapid that no critical days have been observed; but, in milder ones, the crisis has varied from the third to the fifth day, and in those cases where the disease has assumed a remittent form, the crisis has not taken place until the seventh, ninth, and sometimes until the fourteenth day.

*Query 22d.*—Report at large on the treatment, but especially on bleeding, purgatives, cold affusion, tepid ditto, mercury as an alterative, or mercurial oily remedies, sulphate of quinine, &c. &c.

*Answer.*—General bleeding, which had been found useful in the epidemic of 1814, was resorted to from the first breaking out of the disease, both in large and small quantities, but with sanguine temperaments; and under the most marked indications I experienced no favourable result.

I may add, that having tried it occasionally at subsequent periods, it never produced more beneficial effects. Topical bleeding by leeches has materially contributed to relieve the headach, and to check the incipient gastric symptoms.

I have constantly made use of purgative medicines at the commencement of the attack, and I have repeated them occasionally in different stages of the disease, so as to keep the bowels open. Oily purgatives have generally been preferred as being milder in their effects, and less liable to increase the irritability of the stomach.

Cold affusion has been very useful in moderating the preternatural heat of the skin, and checking the increased velocity of the circulation.

Tepid affusion, or fomentations, have been frequently applied on the abdomen or epigastric region, when there was any pain, strangury, or diminution of urine; and the warm bath has been found highly useful in the second stage of the disease, when the pains were severe, and the nervous symptoms attended by great prostration of strength.

Mercury has been most frequently employed in the treatment of this disease; sometimes it has been given in large doses at the commencement of the attack, but more generally has been administered as an alterative, in small and repeated doses; and when resorted to in the first instance, it has undoubtedly been the most valuable remedy in the treatment of this formidable disease, producing beneficial effects not only by its purgative quality, but likewise by its specific action on the hepatic system, and probably by affecting, through the medium of the circulation, the secretory surfaces, then in a state of high irritability and inflammation. Its effects, however, have not always been in proportion to the quantity introduced, but have been chiefly indicated by its influence on the salivary glands, producing a degree of ptyalism which had been followed by a quick and rapid change in all the symptoms, and has afforded the surest prognostic of a favourable termination.

I have nevertheless to lament that, in some of the violent attacks, the system, from causes which I shall not attempt to explain, has appeared unsusceptible of the action of that powerful remedy, even administered in large doses, and with a scrupulous regularity; and the event has then been invariably fatal.

When the increased action of the system had been overcome, and when the remissions were no longer doubtful, which generally happened about the sixth or seventh day, the sulphate of quinine was eminently useful in strengthening the debilitated absorbents, and restoring the energy of the digestive organs,

*Query 23d.*—What were the sequelæ of this disease, visceral obstructions, ague, &c.

*Answer.*—The rapid progress, and the short duration of this disease, leave no time for visceral obstructions to be formed; and the only sequelæ which I observed were, excessive weakness, the impaired state of the digestive organs, and, as a necessary consequence, a protracted and tedious convalescence.

*Query 24th.*—Were other acute diseases observable during the epidemic, particularly intermittent fever?

*Answer.*—No acute diseases have been observed during the epidemic. Intermittent fever is *generally* a disease foreign to this Rock.

*Query 25th.*—Were persons who had suffered once, or had had



the yellow fever of the West Indies, liable to a second attack? state the number of each.

*Answer.*—I believe a first attack of the epidemic in Gibraltar generally produces an immunity from a second attack; and the experience acquired during the different visitations of this disease, has inspired the inhabitants with a well-founded confidence on this subject. There are however, some exceptions; and I may specify two well-marked cases, which had been witnessed by me in 1814, and which have been stated to the Board established in this garrison to investigate that question. I have heard of a few more from incontestible authorities. With respect to the yellow-fever of the West Indies, I have not met among my patients with any that stated himself to have suffered from it in that part of the globe.

*Query 26th.*—What the state of health in the adjacent parts of Spain and Barbary?

*Answer.*—I have not heard of any particular alteration in the general state of health in the adjacent parts of Spain and Barbary, with the exceptions of a few suspicious cases of fever, which occurred in Algeziras during the latter part of October and commencement of November. Those cases which occurred in a yard where there was a number of lodgers, most of them of the lower class, appear to have been marked with symptoms similar to those in this garrison: seven individuals died within a very few days in the same premises; and the disease did not spread, although the intercourse with the sick was not prevented, and although several of the neighbours deserted the place to remove to different parts of the town, which facts furnish a strong argument in favour of the opinion, that the disease had been produced by causes peculiar to that spot, and that it was not in Algeziras, any more than in Gibraltar, propagated by contagion.

Such are the answers which my observations and experience enable me to give to the proposed queries. During the long period of my services in this garrison, I have had the melancholy opportunity of witnessing repeated visitations of the disease, and the circumstance of the epidemic having been constantly limited to the atmosphere of the Rock, beyond which the patients, whether they recovered or died after removal, have never communicated the disease to their families or attendants, has convinced me that the Gibraltar fever differs from those disorders transmissible by the contact of persons or things to whatever place the virus may be carried; and that it is a disease of an endemial character, produced by local causes, combined with accidental circumstances, and so completely dependant upon those causes, that, when their influence ceases it can no longer be propagated, as it does not contain a reproductive power in itself.

This character of the disease, founded on the evidence of facts leads to the inference, that cordons of troops, or any sanitary mea-

asures which tend to keep the population within an infected district, will only aggravate the evil, and be attended with that fear and consternation so fatal in every epidemic ; and that the progress of the disease may only be effectually checked by restoring, if possible, the healthfulness of the locality, and at any rate, by a speedy removal from the source of sickliness. .

*Gibraltar, 24th February 1829.*

FINIS.















